

REMARKS:

Claims 3 through 15 are in this application and are presented for consideration. Claim 3 has been amended and claims 4 through 15 have been added.

The Specification has been amended in order to place it in better form and to further highlight the important features of the invention. Claim 3 has been amended to depend on claim 4 and to have proper antecedent basis on new claim 4.

The Examiner has rejected original claim 1 as being anticipated by Di Stefano. The present invention describes an electrical connector which connects a circuit board to a wire. As explained in the Specification in the first partial paragraph on page 2, connectors which are meant to be connected and disconnected many times experience high contact forces. Very often a housing will be used to absorb these forces. However, due to manufactured tolerances, wear, and other factors, the housing is often not as securely fastened to the circuit board as the solder connection between the connector and the circuit board. Therefore, when the high contact forces are applied to the part of the connector securely fastened to the circuit board, the high contact forces instead of being absorbed by the housing, or if there is no housing, these contact forces are applied directly to the solder connection. These forces applied to the solder connection gradually weaken the solder connection and electrical failure of the solder connection often occurs.

The present invention overcomes this problem by making the electrical connection between the connector and the circuit board block these forces. New claim 5 now sets forth the second connector means forming an electrical connection between the connecting element and the contact means which blocks the force applied to the connecting element from the connection of the first connector means. The contacting means is electrically connected to the circuit board, preferably by a solder joint. In this manner, the first connecting means will be blocked from transmitting force to the contact means and therefore any electrical connection between the contact means and the circuit board will not be affected by the forces of the first connector means. Di Stefano does not teach or suggest any connector means to block the forces created by another connector means. When the connection is made in Di Stefano, high contact forces are applied to the electrical connection on the circuit board. It is in response to problems with connectors like Di Stefano that the present invention has been created. The connection of housing 21 onto pins 29 and 30 applies a force onto pins 29 and 30. Pins 29 and 30 make an electrical connection with other components on the circuit board 27. Nowhere does Di Stefano teach or suggest any structure to block these forces from being transmitted to the electrical connection.

New claim 5 sets forth the structure of a first connector means which when connected to the connecting element, applies a force to the connecting element. A second connector means is also

set forth in claim 5 which blocks the forces applied by the first connecting means from reaching the electrical connection on the circuit board. Claim 5 clearly distinguishes over Di Stefano by this second connecting means blocking forces generated by the first connecting means.

The Examiner has also cited the prior art of Teichler and Casagrande. These references also do not teach or suggest a second connection means to absorb forces applied during the connection of the first connection means. Claim 5 therefore also patentably distinguishes over the cited references for the same reasons as given above with respect to Di Stefano.

The Examiner has stated that Di Stefano has connecting elements 33A and 34A for connection to cable wires 23 and contact elements 29 and 30 for electrical connection with the circuit board. However, these two connections of Di Stefano do not cooperate in the manner set forth in new claim 5. Also, various connections in the other cited references do not cooperate as set forth in new claim 5. This cooperation between the first connector means and second connector means in the present invention is a very important feature of the present invention and applicant has added new claim 5 to more clearly set forth this feature. As stated above, the present invention was created in response to problems caused by connectors such as those in the cited references. The cited references do not even acknowledge the existence of these problems and therefore it is clear that they could not teach or suggest means for overcoming them.

Di Stefano is actually concerned with a completely different aspect of electrical connections. In Di Stefano, the problem is making a good electrical connection when manufacturing tolerances cannot be made small enough to guarantee tight fitting of the tines of a fork in a side-to-side movement. This side-to-side movement sometimes allows the tines to separate from the pin and lose electrical connection. The solution that Di Stefano suggests is to bias the tines in different directions so as therefore to reduce side-to-side movement and guarantee at least one tine in full contact with the pin.

Teichler teaches a terminal strip arrangement where several different partial blocks can snapped onto various positions in a long support plate. This creates a terminal strip which can provide a variety of surfaces for a very large number of telecommunication channels all in one terminal strip that does not have extremely high tolerance errors.

Casagrande is interested in electrical connectors having low insertion forces. While on the surface this may seem similar, it is really concerned with a different aspect of electrical connectors. The goal of Casagrande is to provide a good electrical contact with a low insertion force. Very often, good electrical connections require high contact forces. These can be difficult to work with and harmful to components. However, connectors with low insertion forces typically make weak electrical connections which are easily broken. Therefore, Casagrande is concerned with making a good electrical connection with low insertion forces.

None of these references are concerned with the problem of blocking connection forces from reaching the electrical connection on the circuit board. Therefore applicant states that the present invention defines not only over the individual references, but the fields which they represent. A person skilled in the art would not be led to these references in order to overcome the present problem and knowledge of these references would not lead that person to suggest the present invention.

In the present invention, the contact means and the connecting element are meant to be somewhat permanently mounted to the circuit board. The wires are then to be attached and de-attached from the connecting element. None of the references teach or suggest such an arrangement.

The dependent claims in this application further define over the prior art by setting forth limitations on the connector means. Since the prior art does not teach or suggest connector means cooperating as set forth in claim 5, the dependent claims further limiting the connector means must therefore further differentiate from the prior art and be allowable. Claims 12 and 13 describe a housing surrounding the connector means and this housing absorbs the forces generated by the first connector means. Since some of the references do not even have a force-absorbing housing, claims 12 and 13 definitely define over those references.

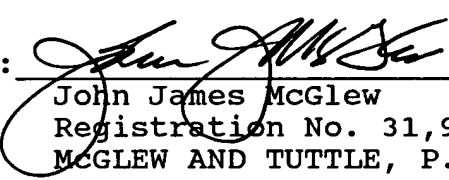
The Examiner has rejected claim 2 as being obvious over Di Stefano in view of Casagrande and obvious over Teichler in view of Casagrande. New claim 4 sets forth the limitations found in claims

1 and 2 which define structure for easy fabrication of the connector element and easy use of the connector element. In the cited combinations, there is no teaching or suggestion to combine these references to suggest the present invention or even to suggest a solution to the problem that the present invention addresses in claim 4. Claim 4 defines over the combination of the prior art for these reasons.


At this time, applicant respectfully requests reconsideration of this application and based on the above amendments, new claims and remarks believes that allowance of this application is warranted.

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